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Abstract

Recent increases of White-faced Ibis (*Plegadis chihi*) in the Great Plains have been considered a "reoccupation" of the species' former range. Review of the published literature and specimen record, however, indicates that this species has only recently become a regular breeder in the Great Plains; thus, recent patterns of summering and nesting birds in the region are best considered a range expansion. Currently, this species is increasing in the Great Plains, where it is an uncommon migrant and local breeder. Extralimital records of this species are also increasing, both along the Atlantic Coast and the Gulf Coast, probably indicative of the health of the mid-continental breeding population. The status of this species in the Great Plains appears linked to fluctuations of core breeding populations, especially those in the Intermountain West.

Keywords

reoccupation, range expansion, breeding population

Disciplines

Natural Resources Management and Policy | Ornithology | Population Biology

Comments

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An assessment of the status of White-faced Ibis (*Plegadis chihi*) in the Great Plains



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ABSTRACT

Recent increases of White-faced Ibis (*Plegadis chihi*) in the Great Plains have been considered a "reoccupation" of the species'

former range. Review of the published literature and specimen record, however, indicates that this species has only recently become a regular breeder in the Great Plains; thus, recent patterns of summering and nesting birds in the region are best considered a range *expansion*. Currently, this species is increasing in the Great Plains, where it is an uncommon migrant and local breeder. Extralimital records of this species are also increasing, both along the Atlantic Coast and the Gulf Coast, probably indicative of the health of the mid-continental breeding population. The status of this species in the Great Plains appears linked to fluctuations of core breeding populations, especially those in the Inter-mountain West.

Background

In the past 50 years, populations of White-faced Ibis (*Plegadis chihi*) have increased throughout the Great Plains, and this increase has recently accelerated. Prior to this increase, the species was very scarce in the Great Plains. The existence of a few historical

breeding records from the late 1800s and early 1900s appears to have led to the supposition that the current range expansion represents a reoccupation of a former regular breeding range (AOU 1983, Ryder and Manry 1994, Sharpe et al. 2001, Dinsmore et al. 1984). It is more likely, however, that the current range expansion is unprecedented and that the species' dynamic status in the Great Plains is linked to fluctuations of core breeding populations elsewhere. This article documents the species' pattern of expansion in the Great Plains, compares the species' historical and modern status, and suggests explanations for these changes.

Status in the Great Plains, 1891–1925

There are three early (pre-1925) breeding records of White-faced Ibis from the Great Plains. The first two were nests found at Heron Lake, Jackson County, Minnesota in 1894 and 1895 (Peabody 1896); the other was found in an area now designated the Harvard Waterfowl Production Area, Clay County, Nebraska in 1916 (Swenk 1918). These are

the only early breeding records north of Texas and east of the Rocky Mountains. Even in central and north Texas, the only breeding records prior to 1900 were from McLennan County (Oberholser 1974). Nonbreeding records prior to 1925 also indicate that the species was rare in the Great Plains. The only Oklahoma record was a specimen taken in 1897 (Sutton 1967), and it was "not cited by early observers" in the Texas Panhandle (Seyffert 2001). Douthitt (1918) noted that it "rarely wandered over Kansas," while Bruner et al. (1904) list three early Nebraska records and considered it a "straggler from the south." The only definite Iowa record was a specimen taken from a flock of 13 ibis in 1891, although another *Plegadis* specimen was taken in 1905 (Kent and Dinsmore 1996). There are no early breeding records for North Dakota or eastern Montana (Ryder and Manry 1994), and there were no confirmed sight records for South Dakota (SDOU 1991), Manitoba, Saskatchewan, or Alberta during this period (Goossen et al. 1995).

Status in the twentieth century after 1925

The second quarter of the twentieth century saw a handful of reports of White-faced Ibis in the Great Plains, followed by a slow increase in reports beginning in 1951. During the years 1926–1950, there were no breeding records in the Great Plains, and the species was scarce. In Nebraska, for example, there was only a single report of a *Plegadis* ibis between 1930 and 1949 (Fichter 1946) and none for Minnesota between 1911 and 1956 (Green and Janssen 1975). In 1951, breeding was discovered at Cheyenne Bottoms, Kansas (Thompson and Ely 1989) and again there in 1962 (Zunanich 1963) and 1965 (Ryder 1967). Since 1965, it has apparently been a regular breeder at Cheyenne Bottoms (Thompson and Ely 1989), which remained the only breeding site in the Great Plains until 1970.

Since 1970, additional breeding sites have been discovered through 1986 (Table 1). The first confirmed nesting record for Canada was at Kininvie, Alberta, in 1982 (Table 1; Goossen et al. 1995). This is contrary to Salt and Salt (1976), who incorrectly cited the year as

Table 1. First nesting records of White-faced Ibis at "new" colonies 1970–1986.

| Year | Location (county in <i>italics</i>) | Source |
|------|--|---------------------------------------|
| 1970 | Lower Latham Reservoir, <i>Weld</i> , CO | Andrews and Righter (1993) |
| 1970 | Bowdoin N.W.R., <i>Phillips</i> , MT | Lokemoen (1979), Lenard et al. (2003) |
| 1973 | Lake Tucumcari, <i>Quay</i> , NM | Hundertmark (1974) |
| 1975 | <i>Ellis</i> , TX | Pulich (1988) |
| 1978 | Sand Lake N.W.R., <i>Brown</i> , SD | SDOU (1991) |
| 1978 | Long Lake N.W.R., <i>Burleigh</i> , ND | Schmidt (1980) |
| 1979 | Kraft Slough, <i>Sargent</i> , ND | Schmidt (1980) |
| 1982 | Lake Nettie N.W.R., <i>McLean</i> , ND | R. Martin, pers. comm. |
| 1982 | Kininvie, Alberta | Goossen et al. (1995) |
| 1984 | Whitewood Lake and Lake Preston, <i>Kingsbury</i> , SD | SDOU (1991) |
| 1984 | Valentine N.W.R., <i>Cherry</i> , NE | Ducey (1984) |
| 1985 | Playa wetland near Hart, <i>Castro</i> , TX | Seyffert (2001) |
| 1986 | Jemmerson Slough, <i>Dickinson</i> , IA | Dinsmore and Dinsmore (1986) |

1975, although breeding may well have occurred earlier than 1982 (Goossen et al. 1995). Reported nesting in Fall River County, South Dakota, in 1978 by Johnsgard (1979) is an apparent error (SDOU 1991; D. Swanson, pers. comm.). During the last quarter of the twentieth century, the increase in reports of breeding birds in the Great Plains accelerated, as evidenced by numerous (29) additional nesting records from 1987 through 2001 (Table 2). Additional breeding records have not, however, been recorded from Iowa, Minnesota, or New Mexico, and breeding has never been documented from Saskatchewan.

As of 2001, there were still only a few sites in the Great Plains where regular breeding occurs (Table 3). However, annual surveys or other unambiguous information that would confirm continuing breeding are not available for all sites where breeding is considered "regular." This is especially true in the Dakotas, where there are few observers and where birds move from year to year to favorable wetlands that are dispersed over a large area. There are at least 11 breeding records from central North Dakota (R. Martin, pers. comm., G. Knutsen, pers. comm., Schmidt 1980), and breeding may occur regularly in that region. The limited number of observers

and thus the limited amount of data from many regions of the Great Plains make assessing the regularity of breeding at many locales difficult. In short, breeding may occur regularly at more locales than indicated here, and some sites thought to be "regular" may have only intermittent breeding, and in fact, the majority of sites where breeding has been recorded are not used regularly. The species is well adapted to finding new nesting areas (Ryder and Manry 1994), and condi-

tions at wetlands throughout the Great Plains are dynamic. A mixed rookery of White-faced Ibis, Cattle Egrets (*Bubulcus ibis*), and Black-crowned Night-herons (*Nycticorax nycticorax*) was discovered at a playa in Meade County, Kansas after a seven-inch rain that filled the playa to record levels (Flowers 1998). White-faced Ibis were found breeding at a playa in Clay County, Nebraska in June 2001 following heavy snowmelt. This colony was unsuccessful, however, due to declining summer water levels (JGJ, pers. obs.). Variable water levels at reservoirs on the eastern plains of Colorado limit optimal nesting conditions (R. Levad, pers. comm.). Regular breeding locales are also susceptible to variable water conditions: Cheyenne Bottoms, for example, dried up completely in the late 1980s (Grzybowski 1989) and was not used by ibis during those years.

In addition to breeding records, larger numbers of nonbreeding White-faced Ibis and increases in the frequency of its occurrence have been noted on the Great Plains and adjacent areas. The dramatic change in status in South Dakota is perhaps the best illustration: following the first state record in 1962, it was described as "rare to uncommon" by 1991 (SDOU 1991), and by 2001, it was considered "locally common" (Tallman

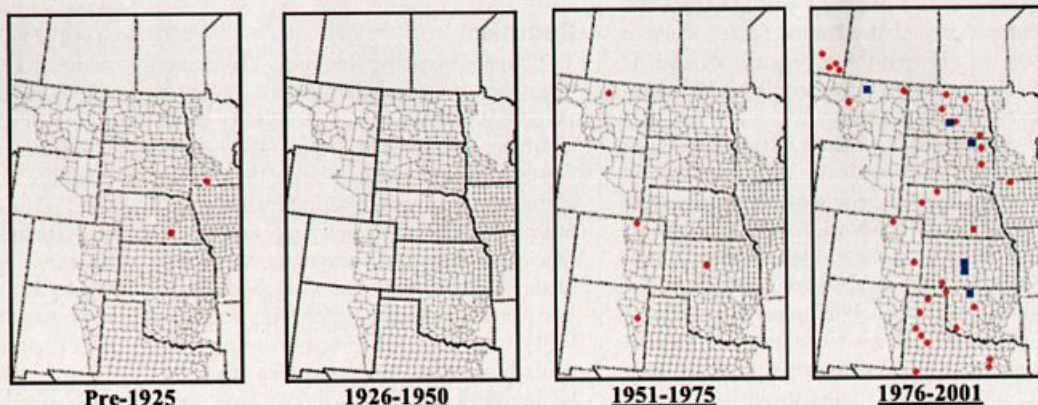


Figure 1. Breeding locations of White-faced Ibis in the Great Plains, 1900 to present, in 25-year increments. Blue squares indicate regular breeding sites; red dots indicate isolated records.



Figure 1. White-faced Ibis has shown a remarkable pattern of colonization in the Great Plains, especially since the 1970s. This expansion appears to be recent rather than a re-occupation of former range. Images in this article are of adult White-faced Ibis at Banner Wildlife Area, Warren, Iowa, photographed 3 October 2004 by Jay Gilliam.

et al. 2002). Similarly, in Nebraska, Johnson (1980) described the species as "extremely rare" in 1980, but two decades later, Sharpe et al. (2001) considered it a "fairly common migrant." In the Texas Panhandle, where "as late as mid-century [ca. 1950] it was considered rare," it is now "uncommon to common" (Seyffert 2001). In Iowa, White-faced Ibis was listed as "accidental" in the early 1980s (Dinsmore et al. 1984), but just over a decade later it was considered "regular" but "rare" (Kent and Dinsmore 1996). Recent counts of the species in the Great Basin have been impressive: 2000 were at Cheyenne Bottoms and Quivira N.W.R. on 1 September 1996 (Grzybowski 1996), and 400 were at a single wetland in North Dakota 11 August 2001 (R. Martin, pers. comm.). Increased frequency of occurrence has also been reported along the Atlantic Coast of the United States, where a few decades ago the appearance of a single White-faced Ibis was considered extraordinary (Brinkley 2002).

Since 2001, the Great Plains have been markedly drier than the decade prior, and portions have experienced persistent severe drought (see Grzybowski 2002, Grzybowski and Silcock 2004a, 2004b, Martin 2003). Shifts in local abundance of White-faced Ibis are unquestionably influenced by climate and resulting habitat conditions. In recent years, breeding activity appears to have been limited to large and relatively stable wetlands, such as those in the Dakotas (e.g., nesting confirmed at Lake Bertha, Cass

County, North Dakota in 2002 [Martin 2003]). It is not clear whether high concentrations and increased frequency in peripheral areas represent actual increases or whether local birds are augmented by birds displaced from other areas. In 2002, 400–500 White-faced Ibis were recorded in Day County, South Dakota 15 September (Martin 2003). White-faced Ibis has become "almost annual" at a few sites in the southern Prairie Provinces (Koes and Taylor 2004), with an "astounding 85" at Whitewater Lake, Manitoba 21 August 2004 (Koes and Taylor 2005); the species nested at this site in July 2005 (R.F. Koes, pers. comm.). Reports continue to be regular in western sections of both Minnesota and Iowa. The overall trend of increase in the Great Plains appears to continue.

Discussion

The supposition that the Great Plains was once part of the regular, historic breeding range of White-faced Ibis appears to be based on three early breeding records; however, this conclusion is not justified in the context of the species' overall historic occurrence. All other available information suggests that the species was scarce or absent in the region until the middle twentieth century and that it has increased in this region only recently. White-faced Ibis are distinctive and not particularly secretive, so the presence of a regular breeding population should have produced additional sightings, including migrants, by early observers. Moreover, the

early breeding records from Minnesota and Nebraska are isolated, not only from regular breeding areas but also spatially and temporally from each other. Extralimital breeding records in Florida—in the same years as breeding took place in Minnesota (Brewster 1896, Ryder and Manry 1994)—perhaps suggest wandering from regular breeding locales in those years. Occasional extralimital breeding by ciconiids is of course by no means unusual. The historical status of White-faced Ibis in the Great Plains may be similar to the current status of Tricolored Heron (*Egretta tricolor*) in this region, for instance. This species has nested on several occasions in Kansas (Thompson and Ely 1989), on three occasions in South Dakota (Martin 2001), and at least once in North Dakota (Lokenmoen 1979). However, it is otherwise casual throughout the Great Plains, with only three accepted records for Nebraska (Sharpe et al. 2001, Grzybowski 2001a, 2001b), four for Iowa (Kent and Dinsmore 1996; J. Dinsmore, pers. comm.), and fewer than 10 for South Dakota through 2001.

The Great Plains clearly did not support a significant breeding population of White-faced Ibis in the late nineteenth through middle twentieth centuries. Its patterns of occurrence there, both historic and recent, are most likely tied to trends in the species' core breeding areas. In North America, the core breeding populations of White-faced Ibis are found in coastal areas of Louisiana and Texas and in the Intermountain region of the western United States (Ryder and Manry 1994, AOU 1983). The North American breeding range also includes much of Mexico (AOU 1983), where the species' breeding distribution is rather poorly known (Ryder and Manry 1994). White-faced Ibis are locally common in Texas, but numbers have been generally decreasing there. Oberholser (1974) noted "formerly (prior to ca. 1916) more numerous generally, with breeding colonies inland." Breeding at several inland counties had ceased by the early 1900s (Oberholser 1974). The Texas coastal population has continued to decrease, by "about 65% from 1969 to 1973" (King 1980, Webster 1975) and "from 6,500 to 2,300 pairs between 1981 to 1990" (Ryder and Manry 1994). Likewise, in adjacent Louisiana, White-faced Ibis numbers dropped by about 50% between the years 1976 and 1990, down to 6225 pairs (Ryder and Manry 1994). The Intermountain West also recorded decreases in nesting White-faced Ibis during the early and middle twentieth century (Ryder 1967, Ryser 1985), but there was an impressive increase documented in the region beginning in the late 1970s (Ryder and Manry 1994, Kingery 1980, Ryser 1985, Sabo 1992). The population in the Great Basin, for instance, nearly tripled in the period 1985–1997, despite years of drought

Table 2. Additional White-faced Ibis breeding records in the Great Plains, 1987–2001.

| | | |
|--|--|---|
| Alberta | | |
| Pakowki Lake | one nest in 1986, 3 pairs in 1996 | Goossen et al. (1995), Koes and Taylor (1996) |
| Stirling Lake | 2 nests in 1992 | Goossen et al. (1995), Koes and Taylor (1992) |
| Southeast of Calgary | Nested in 1999 | Koes and Taylor (1999) |
| Colorado (eastern plains) | | |
| Nee Noshe Reservoir, Kiowa Co. | 25–60 individuals in 1998 | Truan and Percival (1998) |
| Kansas | | |
| Lakeview, Meade Co | 20+ nests in 1997 | Flowers (1998) |
| Montana | | |
| Benton Lake N.W.R., Cascade Co. | First discovered in 1994 | Berkey (1995) |
| Medicine Lake N.W.R., Sheridan Co. | First discovered in 2000 | Martin (2000) |
| Nebraska | | |
| Crescent Lake N.W.R., Garden Co. | First discovered in 1987, nested again in 1998 | Huber 1988, Sharpe et al. (2001) |
| Kissinger Basin W.M.A., Clay Co. | 2001 nesting attempt, 25 pairs, unsuccessful | pers. obs. |
| North Dakota | | |
| Stony Slough, Burleigh Co. | Nested in 1988 | R. Martin, pers. comm. |
| J. Clark Sawyer N.W.R., McHenry Co. | Nesting confirmed in early 1990s, birds present in 2000 and 2001 | R. Martin, pers. comm. |
| Lake Alice N.W.R., Ramsey Co. | Several nests in 2000 | Martin (2000) |
| Dewald Slough, Kidder Co. | 4–6 pairs in 2001, birds present since 1988, perhaps regular breeder | R. Martin, pers. comm. |
| 11 km south of Tappan, Kidder Co. | Possibly 2 pairs in 1999, unconfirmed | R. Martin, pers. comm. |
| McKenzie Slough, Burleigh Co. | Possible nesting in 2001, unconfirmed | R. Martin, pers. comm. |
| Lake Bertha, Cass Co. | Possibly 2 pairs in 2001, unconfirmed | R. Martin, pers. comm. |
| Logan Co. | Possibly 3–5 pairs in 2000, unconfirmed | R. Martin, pers. comm. |
| Oklahoma | | |
| Near Hennessey, Kingfisher Co. | Nested in 2000, 40+ nests | J. Arterburn, pers. comm. |
| Hackberry Flat, Tillman Co. | Nested in 2001 | Grzybowski (2001) |
| West of Harper Co.–Beaver Co. line, Beaver Co. | Nested in 2001, approx. 25 nests | J. Arterburn, pers. comm. |
| Texas (north and pandhandle) | | |
| Ralls Sewage Ponds, Crosby Co. | Nested 1987 | Seyffert (2001) |
| Midland Co. | Nested at 2 locations in 1987 | Williams (1987) |
| Playa, near Plainview, Hale Co. | Nested 1989, "small" colony | Seyffert (2001) |
| Playa, 26 km south of the above site, Hale Co. | Nested 1989, 50+ pairs | Seyffert (2001) |
| Dallas Co. | Nested in 1990 | Lasley and Sexton (1990) |
| Playa, near Spearman, Hansford Co. | Nested 1997, at least 2 pairs | Seyffert (2001) |
| Playa, near Claude, Armstrong Co. | 6–7 ibis carrying nesting material in 1997 | Seyffert (2001) |
| Buffalo Lake N.W.R., Randall Co. | 15 nests in 1999 | Seyffert (2001) |

and flooding (Earnst et al. 1998). In the San Luis Valley of Colorado, the breeding population increased from 200–300 pairs in the mid-1980s to an estimated 4500 pairs in 2001 (R. Levad, pers. comm.). In the early twentieth century, the withdrawal of the species from inland breeding areas in Texas coincided with the decreased occurrence farther north on the Great Plains. Thus it seems reasonable to conclude that the early extralimital records, including the few breeding records, were linked to the Gulf Coast populations, from which wandering individuals (perhaps spurred by drought or other stimuli) moved northward and discovered favorable conditions for breeding.

The recent increase in breeding activity in the Great Plains may indicate recruitment from White-faced Ibis populations of the

Gulf Coast, where wetlands quality and extent may have been reduced in recent decades. Pesticides have also been blamed for the declines in numbers throughout the species' range (Ryder and Manry 1994, Ryder 1985, King et al. 1980). It is conceivable that the Gulf Coast populations have suffered declines because of the use of the pesticide Aldrin to treat rice, an important Gulf Coast crop (King et al. 1980, Webster 1975); use of this pesticide was discontinued after 1974. The banning of organochlorine pesticides such as DDT and DDE is believed to be partially responsible for the recent increases in the Intermountain West populations of the species (Ryder and Manry 1994, Ryser 1985), but Earnst et al. (1998) question the importance of pesticide bans as a factor in ibis population increases. Because the dra-

matic increase in numbers of White-faced Ibis in the Intermountain West mirrors the increase, in timing and fashion, of the species on the Great Plains, the source of recent pioneering birds on the Great Plains seems most likely derived from the West rather than the Gulf Coast. (An exception may be the few birds that bred at Cheyenne Bottoms in 1951 and subsequently. The geographic source of these few pioneering birds could be either from the west or south; we have no basis for speculation in that case.) Finally, global climate change, which appears to have radically changed coastal wetlands' composition, extent, and salinity in recent years in Louisiana for instance (Davis-Wheeler 2004), should be considered a possible factor in the changing distribution of White-faced Ibis.

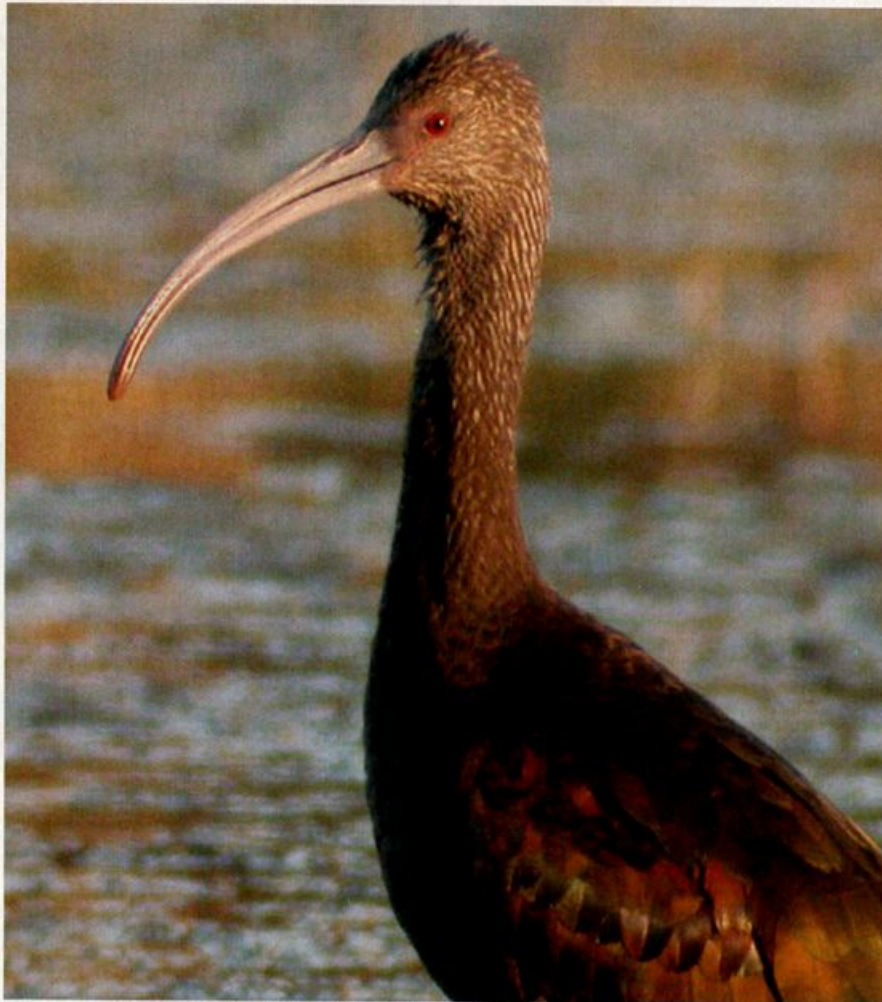


Figure 2. This adult White-faced Ibis was likely a fall migrant moving southward after breeding somewhere in the northern Great Plains. Fall numbers in the Great Plains are on the increase, and each year a few are detected in states to the east, most in September and October.

Conclusions

Based on a review of specimens and reports of the species 1891–2001, we conclude that White-faced Ibis was never a regular breeder in the Great Plains and was historically scarce there. Recent population increases in the region are probably unprecedented. The expansion of White-faced Ibis in the Great Plains appears to coincide with population fluctuations in core breeding areas; historically, such increases seemed linked to fluctuations of Gulf Coast populations, while more recent increases appear to be related to the explosive growth of populations in the Intermountain West. In order for changes in this species' breeding distribution to be tracked accurately in the future, birders should keep careful records of extralimital White-faced Ibis, both breeding and non-breeding birds, and report these to the appropriate committees or record-keepers.

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Figure 3. If pioneering White-faced Ibis continue to encounter favorable breeding conditions in the Great Plains, it seems likely that the current range expansion will continue, although factors such as the status of core populations or hybridization with Glossy Ibis may affect this pattern.

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Table 3. Regular White-faced Ibis breeding locales in the Great Plains.

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| Cheyenne Bottoms, Barton, KS | First in 1951, currently an estimated 100 pairs breed regularly | K. Grover, Field Supervisor, C.B.W.A., pers. comm. |
| Quivira N.W.R., Stafford, KS | Estimated 50 pairs | D. Hilley, pers. comm. |
| Bowdoin N.W.R., Phillips, MT | First recorded 1970, regular; current numbers not known | Lokemeon (1979) |
| Salt Plains N.W.R., Jet, OK | First discovered in 1995, breeding has continued since, 750 counted in June 2002 | Grzybowski (1995), J. Arterburn, pers. comm. |
| Long Lake N.W.R., Burleigh, ND | 8–13 pairs in 2001, also nested in 2000, perhaps a regular breeder | R. Martin, G. Knutsen, pers. comm. |
| Sand Lake N.W.R., Brown, SD | First nested in 1978. 150 pairs recorded in 1996 | SDOU (1991), Palmer (1996) |